

IN THE CLAIMS

1. (Currently Amended) A switch comprising:

a port configured to receive a write command frame, the frame having a header comprising an originator exchange identifier (OX_ID) field and ~~[[or]]~~ a receiver exchange identifier (RX_ID) field, as well as a Host identifier field and a target identifier field, wherein the Host and the target identifier fields identify Host and target devices, and wherein the OX-ID and the RX-ID exchange identifier fields enable the Host and the target to keep track of various transactions between each other;

a trapping mechanism configured to trap the write command frame; and

a processor configured to process the trapped write command frame by modifying the OX_ID field of the write command frame header to include a new value of an OX_ID exchange identifier before sending the write command frame to the target;

wherein the processor is further configured to

generate a transfer ready command frame,

initialize a receiver exchange identifier (RX_ID) of the ~~[[a]]~~ transfer ready command frame by assigning a value to the RX_ID field, the assigned RX_ID corresponding to a write command session, ~~[[and]]~~

send the transfer ready command frame to the initiating Host before receiving a transfer ready command frame from the target;

receive a command frame with the assigned RX_ID value; and

use the RX_ID value as a handle for accessing information pertaining to the write command session in a sessions table, the sessions table storing information about one or more sessions or exchanges.

2. (Previously Presented) The switch of claim 1, wherein the switch is an initiating Switch coupled to the Host in a first SAN.

3. (Previously Presented) The switch of claim 2, wherein the processor of the initiating Switch is further configured to modify the write command frame before forwarding the write command to the target.

4-5. (Cancelled)

6. (Previously Presented) The switch of claim 2, wherein the processor of the initiating Switch is further configured to issue a Transfer Ready command to the Host.

7. (Currently Amended) The switch of claim 1, wherein the switch is further configured to use the assigned RX-ID value as the RX_ID for all communication related to the write command [[frame]] between the switch apparatus and the Host.

8. (Currently Amended) The switch of claim 1, wherein the switch is further configured to use the new OX_ID value as the OX_ID in all communications between the apparatus and the target.

9. (Previously Presented) The switch of claim 2, wherein the initiating Switch is further configured to transfer additional data frames to the target when the initiating Switch receives a Transfer Ready command associated with the write command frame from the target.

10. (Previously Presented) The switch of claim 30, wherein the Switch is a target Switch coupled to the target.

11. (Previously Presented) The switch of claim 10, wherein the target Switch forwards the write command frame to the target.

12. (Previously Presented) The switch of claim 11, wherein the target Switch forwards data frames associated with the write command frame to the target after receiving a Transfer Ready command from the target.

13. (Previously Presented) The switch of claim 12, wherein the target Switch is further configured to buffer the data frames prior to receipt of the Transfer Ready command.

14. (Previously Presented) The switch claim 12, wherein the target Switch is further configured to maintain a sessions ID table and to use the OX_ID value of the write command frame as an index to the session corresponding to the write command.

15. (Previously Presented) The switch of claim 10, wherein the target Switch is further configured to modify the RX_ID value for all communication related to the write command frame between the target Switch and the Host.

16. (Previously Presented) The switch of claim 5, wherein the target Switch is further configured to modify the OX_ID value in communications between the target Switch and the target.

17. (Previously Presented) The switch of claim 1 wherein the switch is further configured to use the RX_ID value of trapped write commands to specify the amount of buffer space needed for the write command and use the write command frame to request the needed buffer space.

18. (Previously Presented) The switch of claim 17, wherein the switch is further configured to use the RX_ID value of trapped write commands to specify the amount of buffer space larger than needed for the write command and use the additional buffer space for subsequent write commands so that the apparatus need not wait for a Transfer Ready command to transfer data related to the subsequent write command.

19. (Previously Presented) The switch of claim 1, wherein the switch is further configured to, in the event the switch does not have sufficient buffer space for the write command, to either:

- (i) generate a busy status signal to the initiating Host;
- (ii) place the write command on a pending wait list; or
- (iii) forward the write command to the target.

20. (Previously Presented) The switch of claim 1, further comprising:
a first SAN including the switch;
a second SAN; and
an inter-SAN network connecting the first SAN and the second SAN.

21-23. (Cancelled)

24. (Currently Amended) A method comprising:

receiving a write command at a switch, the write command specifying a host identifier corresponding to a host device and a target identifier corresponding to a target device, the write command also including an originator exchange identifier (OX_ID) field with an assigned value and an uninitialized receiver exchange identifier (RX_ID) field with a default value, wherein the OX-ID and the RX-ID fields enable the host and the target to keep track of various transactions between each other;

generating a transfer ready command at the switch;

initializing a [[the]] receiver exchange identifier (RX_ID) of the transfer ready command by assigning a value to the RX_ID field, the assigned RX_ID value corresponding to a write command session;

sending a transfer ready command including the initialized RX_ID to the host prior to receiving a transfer ready command from the target, wherein sending the transfer ready command to the host allows the switch to operate as a proxy for the target;

modifying the originator exchange identifier (OX_ID) of the write command to generate a modified write command; [[and]]

forwarding the modified write command to the target;

receiving a command with the assigned RX_ID value; and

using the RX_ID value as a handle for accessing information pertaining to the write command session in a sessions table, the sessions table storing information about one or more sessions or exchanges. .

25. (Previously Presented) The method of claim 24, further comprising configuring the switch to forward data frames associated with the write command received in response to the transfer ready command to the target.

26. (Previously Presented) The method of claim 25, wherein a second switch between the switch and the target receives data frames associated with the write command and buffers the data frames until a transfer ready command is received from the target.

27. (Currently Amended) An apparatus comprising:

means for receiving a write command at a switch, the write command specifying a host identifier corresponding to a host device and a target identifier corresponding to a target device, the write command also including an originator exchange identifier (OX_ID) field with an assigned value and an uninitialized receiver exchange identifier (RX_ID) field with a

default value, wherein the OX-ID and the RX-ID exchange identifier fields enable the host and the target to keep track of various transactions between each other;

means for generating a transfer ready command;

means for initializing a ~~[[the]]~~ receiver exchange identifier (RX_ID) of the transfer ready command ~~to generate an initialized RX_ID~~ by assigning a value to the RX_ID field, the assigned RX_ID value corresponding to a write command session;

means for sending a transfer ready command including the initialized RX_ID to the host prior to receiving a transfer ready command from the target, wherein sending the transfer ready command to the host allows the switch to operate as a proxy for the target;

means for modifying the originator exchange identifier (OX_ID) field of the write command to generate a modified write command; ~~[[and]]~~

means for forwarding the modified write command to the target;

means for receiving a command with the assigned RX_ID value; and

means for using the RX_ID value as a handle for accessing information pertaining to the write command session in a sessions table, the sessions table storing information about one or more sessions or exchanges.

28. (Currently Amended) The switch as recited in claim 1, wherein the switch is further configured to determine from the write command an amount of data to be written to the target, to ascertain whether it has sufficient storage space to buffer the amount of data, and to send the generated transfer ready command frame to the initiating Host before receiving a ~~[[the]]~~ transfer ready command from the target if the switch has determined that it has sufficient storage space to buffer the amount of data.

29. (Currently Amended) A method comprising:

receiving a write command at a switch, the write command specifying a host identifier corresponding to a host device and a target identifier corresponding to a target device, the write command also including an originator exchange identifier (OX_ID) field ~~with an assigned value and a~~ an uninitialized receiver exchange identifier (RX_ID) field ~~with a default value,~~ wherein the OX-ID and the RX-ID exchange identifier fields enable the host and the target to keep track of various transactions between each other;

assigning a new value to the OX-ID field in the write command;

forwarding the write command to the target;

receiving a transfer ready command from the target;

~~initializing the receiver exchange identifier (RX_ID) to generate an initialized RX_ID by assigning a value to the RX_ID field; and~~

~~sending the [[a]] transfer ready command including the initialized RX_ID to the host prior to receiving a transfer ready command from the target, wherein sending the transfer ready command to the host allows the switch to operate as a proxy for the target;~~

~~receiving a command with the assigned OX_ID value; and~~

~~using the OX_ID value as a handle for accessing information pertaining to the write command session in a sessions table, the sessions table storing information about one or more sessions or exchanges.~~

30. (Currently Amended) An apparatus comprising:

an interface;

a processor; and

a memory, at least one of the interface, the processor or the memory being for:

receiving a write command ~~at a switch~~, the write command specifying a host identifier corresponding to a host device and a target identifier corresponding to a target device, the write command also including an originator exchange identifier (OX_ID) field ~~with an assigned value~~ and ~~a an uninitialized~~ receiver exchange identifier (RX_ID) field ~~with a default value~~, wherein the OX-ID and the RX-ID exchange identifier fields enable the host and the target to keep track of various transactions between each other;

assigning a new value to the OX-ID field in the write command

forwarding the write command to the target;

receiving a transfer ready command from the target;

~~initializing the receiver exchange identifier (RX_ID) by assigning a value to the RX_ID field and~~

~~sending the [[a]] transfer ready command including the initialized RX_ID to the host prior to receiving a transfer ready command from the target, wherein sending the transfer ready command to the host allows the switch to operate as a proxy for the target;~~

receiving a command with the assigned OX_ID value; and

using the OX_ID value as a handle for accessing information pertaining to the write command session in a sessions table, the sessions table storing information about one or more sessions or exchanges.

31. (Previously Presented) The switch as recited in claim 1, wherein the trapping mechanism is configured to trap the write command frame if the write command frame designates a predetermined Host_ID and a predetermined target_ID.